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EXAMINER

CHAN, ALEX H

ART UNIT PAPER NUMBER

2633

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/781,857

Applicant(s)

ERDOGAN ET AL.

Examiner

Alex H Chan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-14, 17 and 18 is/are rejected.
- 7) ☒ Claim(s) 9, 10, 15 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. Amendment filed on February 3<sup>rd</sup>, 2004 is herein acknowledged.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 8, 11, 13 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,567,167 B1 to Chou et al (hereinafter Chou) in view of U.S. Patent No. 5,815,270 to Lee or U.S. Patent No. 5,440,390 or U.S. Patent No. 5,296,913 to Heffner.

**Regarding claim 11**, Chou discloses an optical transmission system comprising a transmitter (15 of Fig. 1) for providing one or more optical input signals (Col. 5, lines 16-24), an optical fiber transmission path (22 of Fig. 1) and an optical receiver (240 of Fig. 1), said optical transmission system further comprising at least one active polarization control arrangement (e.g. combination of 100 and 200 of Fig. 1), each active polarization control arrangement including a polarization control element (e.g. 100 or 108 or 170 or 200 of Fig. 1) responsive to one or more input optical signals propagating along the optical fiber transmission path (e.g. 100 collimates optical signals from output 21 of Fig. 1 and Col. 3, lines 36-57, or 200 separates the two states of polarization from 10, Col. 4, lines 30-42), the polarization control element for producing as an

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output an optical signal exhibiting a predetermined state of polarization (Col. 3, lines 44-52); an in-line polarimeter (e.g. 110 and 210) integral with said optical fiber transmission path (e.g. since 100 is coupled between fiber input 21 and output end 103, integral with optical fiber transmission path is achieved) and configured to out-couple signals determined by the state of polarization of the input optical signal (Col. 4, lines 14-30); and a feedback control element (120 or 220 of Fig. 1) disposed in a signal path between the in-line polarimeter (210 of Fig. 1) control signal output (215 of Fig. 1) and an adjustable input (e.g. via 130 of Fig. 1) to the polarization control element (170 of Fig. 1), said feedback control element for providing correction signal inputs to the polarization control element based on the control signal outputs from the in-line polarimeter (Col. 8, lines 31-65). Chou does not explicitly disclose that such in-line polarimeter is an in-line fiber polarimeter. Lee disclose an in-line fiber-optic polarimeter (via 10, 24, 38 and 40 of Fig. 1). Tirri also discloses an optical fiber polarimeter (via 10 and 16 of Fig. 2). Likewise, Heffner discloses an in-line fiber polarimeter (e.g. the loops of optical fiber can be easily integrated into the polarimeter, Col. 7, lines 19-23). Accordingly, one of the ordinary skilled in the art would have been motivated to employ an in-line fiber polarimeter so as to make the system more compact and rugged (Col. 3, lines 19-24 and lines 51-55, Lee) or reduce the limits due to size and complexity of the instrument (Col. 1, lines 36-40, Tirri) or for serving as input path to polarimeter (Col. 7, lines 19-23, Heffner). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the fiber optic transmission system of Chou by incorporating an in-line fiber polarimeter because it helps to make the system more compact and rugged as suggested by Lee, reduces the limits due to size and complexity of the instrument as suggested by Tirri and serves as input path to polarimeter as

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suggested by Heffner. Also, lacking any criticality, to make prior arts integral does not make the claimed invention patentable over that prior art (In re Larson, 144 USPQ 347) or to shift location of prior art parts does not make the claimed invention patentable over that prior art (In re Japikse, 86 USPQ 70).

**Regarding claim 13**, Chou in view of Lee or Tirri discloses all limitations as discussed above, and further discloses a polarization beam splitter (165 and 202 of Fig. 1 or 114, 116, 117, 119 of Fig. 2 or 171 and 172 of Fig. 3), disposed at the output of the in-line fiber polarimeter (110 and 210 of Fig. 1, Chou or via 10, 24, 38 and 40 of Fig. 1, Lee or via 10 and 16 of Fig. 2, Tirri), the polarization control element utilized to adjust the output signal state of polarization (e.g. by measuring the difference between optical signals having different polarization components or PSPs) to align with one of the beamsplitter principal axes (Col. 5, lines 55-Col. 6, lines 11 and Col. 8, lines 31-42).

**Regarding claim 18**, Chou in view of Lee or Tirri discloses all limitations as discussed above, and further discloses at least one active polarization control arrangement (e.g. combination of 100 and 200 of Fig. 1) comprises an in-line fiber polarimeter (110 and 210 of Fig. 1, Chou or via 10, 24, 38 and 40 of Fig. 1, Lee or via 10 and 16 of Fig. 2, Tirri) located at the optical receiver (240 of Fig. 1) and the polarization controller (108 of Fig. 1) located at the optical transmitter (15 of Fig. 1), using a telemetry channel (132 or 134 of Fig. 1) to transmit

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feedback information (e.g. via 122 and 120 of Fig. 1) from the in-line fiber polarimeter to the polarization controller (Col. 3, lines 36-57).

**Regarding claim 8**, the limitations introduced by claim 8 correspond to the limitations introduced by claim 11. The treatment of claim 11 above reads on the corresponding limitations of claim 8.

4. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou in view of U. S. Patent No. 6,385,356 B1 to Jopson et al (hereinafter Jopson).

**Regarding claim 12**, Chou in view of Lee, Tirri or Heffner discloses all limitation as discussed above, and further discloses an optical fiber transmission path (22 of Fig. 1) comprises the active polarization control arrangement (e.g. combination of 10 and 200 of Fig. 1) is used to orient the polarization axes (e.g. x and y optical axes) of the optical output from the in-line fiber polarimeter (Col. 5, lines 39-54 and 110 and 210 of Fig. 1, Chou or via 10, 24, 38 and 40 of Fig. 1, Lee or via 10 and 16 of Fig. 2, Tirri). Chou in view of Lee, Tirri or Heffner does not disclose at least a section of birefringent fiber and the active polarization control arrangement is used with the optical axes of the birefringent transmission path optical fiber. Jopson discloses at least a section of birefringent fiber (1010 of Fig. 10 and Col. 7, lines 54-59) and the active polarization control arrangement (1020 of Fig. 10) is used with the optical axes of the birefringent transmission path optical fiber (Col. 7, lines 3-16, lines 64-67 and Col. 8, lines 1-5).

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Accordingly, one of the ordinary would have been motivated to incorporate a section of birefringent fibers and the active polarization control arrangement is used with the optical axes of the birefringent transmission path fiber in order to impart an uniformly oriented PMD to the light beam traveling through the fibers (Col. 2, lines 18-29). Therefore, it would have been obvious to one of artisan skilled in the pertinent art at the time the invention was made to have modified the fiber optic transmission system of Chou in view of Lee, Tirri or Heffner by incorporating a section of the birefringent fibers for orienting the optical axes of the birefringent transmission path fiber because Jopson suggests that this allows PMD uniformity to the light beam traveling through the fibers.

5. **Claims 1-5, 14 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou in view of Lee, Tirri or Heffner as applied to claim 11 above, and further in view of U. S. Patent No. 6,208,442 B1 to Liu et al (hereinafter Liu).

**Regarding claim 14**, Chou discloses an optical transmission system having polarization beam splitters (165 and 202 of Fig. 1 or 114, 116, 117, 119 of Fig. 2 or 171 and 172 of Fig. 3) but does not disclose that the transmission system further comprises wavelength filters disposed at each output of the polarization beam splitter to discriminate between two orthogonal channels with closely spaced wavelengths. Liu discloses wavelength filters (e.g. 742 and 744 of Fig. 7) disposed at each output of the polarization beam splitter (724a and 724b or 747 of Fig. 7 and Col. 5, lines 42-65) to discriminate between two orthogonal channels with closely spaced wavelengths (Col. 5, lines 40-42, lines 15-32 and Col. 3, lines 58-65). Accordingly, one of the

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ordinary skill in the art would have been motivated to incorporate wavelength filters in order to provide different polarization to contiguous channels (Col. 2, lines 24-30). Therefore, it would have been obvious to one of ordinary skill in the art to have modified the fiber optic transmission system of Chou by placing wavelength filters disposed at each output of the polarization beam splitters because Liu suggests that this allows a plurality of channels to have a first and second polarization.

**Regarding claim 17**, Chou discloses all limitation as discussed above, and further discloses at least one active polarization control arrangement comprises a first arrangement (100 of Fig. 1, Chou) disposed at an optical transmitter (15 of Fig. 1, Chou) and a second arrangement (200 of Fig. 1, Chou) disposed at an optical receiver (240 of Fig. 1, Chou).

**Regarding claim 1**, Chou in view of Lee, Tirri or Heffner and Liu discloses a WDM optical communication system (Col. 1, lines 19-21, Liu) including an arrangement for assessing the polarization (100 or 200 of Fig. 1, Chou) of each optical signal (Col. 3, lines 39-41, Chou) within a plurality of wavelength division multiplexed signals (Col. 1, lines 21-24, Liu) propagating along a transmission optical fiber path (22 of Fig. 1, Chou), the arrangement comprising at least one in-line fiber polarimeter (110 and 210 of Fig. 1, Chou or via 10, 24, 38 and 40 of Fig. 1, Lee or via 10 and 16 of Fig. 2, Tirri) disposed along and integral with said transmission optical fiber path, said at least one in-line fiber polarimeter configured to out-couple



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predetermined portions of each optical signal (Col. 4, lines 14-30, Chou) passing therethrough to collect information (e.g. via 120 of Fig. 1, Chou) with respect to the state of polarization (i.e. PSPs) for each optical signal (Col. 3, lines 48-53, Chou); and a network control element (108 of Fig. 1, Chou), responsive to the output from said at least one in-line fiber polarimeter (110 and 210 of Fig. 1, Chou or via 10, 24, 38 and 40 of Fig. 1, Lee or via 10 and 16 of Fig. 2, Tirri), for either one of modifying and controlling the polarization of one or more of said optical signals in response to the state of polarization information (Col. 3, lines 53-57, Chou).

**Regarding claim 2**, Chou discloses all limitation as discussed above, and further discloses a plurality of in-line fiber polarimeters (110 and 210 of Fig. 1, Chou or via 10, 24, 38 and 40 of Fig. 1, Lee or via 10 and 16 of Fig. 2, Tirri) (e.g. state of polarization (SOP) can be determined and defined in terms of Formula 1 (Col. 4, lines 43-Col. 5, lines 15) and thus also make it a complete or partial polarimeter).

**Regarding claims 3-5**, the limitations introduced by claims 3-5 correspond to the limitations introduced by claim 2. The treatment of claim 2 above reads on the corresponding limitations of claims 3-5.

*Allowable Subject Matter*

6. **Claims 9, 10, 15 and 16** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Response to Arguments*

7. Applicant's arguments filed February 3<sup>rd</sup>, 2004 with respect to claim 11 have been fully considered but are moot in view of the new ground(s) of rejection.

8. In addition, **regarding claims 17**, applicants argue that there is no teaching in Chou of utilizing a first polarization control arrangement at an optical transmitter and a second polarization control arrangement at an optical receiver (remarks, page 9) but have not provided sufficient explanation as to how the applicants' first and second polarization control arrangement distinguish from Examiner's previously stated explanation of polarization controller 100 and delay controller 200 as constituting such elements. Therefore, consideration of argument in view of claim 17 has not been given merits. Also, the Examiner respectfully submits and reminds the applicants that the polarization controller 100 operates to determine the principal states of polarization of the optical medium and transform the optical signal based on the PSP while delay controller 200 operates to generate a signal proportional to the PMD time delay so as to minimize PMD time delay of the transformed optical signal (Col. 2, lines 1-13, Chou). It is

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therefore clear to one of ordinary skilled in the art that both 100 and 200 constitute as a first and second polarization control arrangement respectively for controlling the optical signal.

*Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

10. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

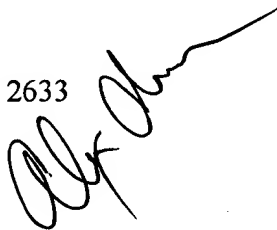
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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alex Chan  
Patent Examiner, AU 2633  
March 10<sup>th</sup>, 2004



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